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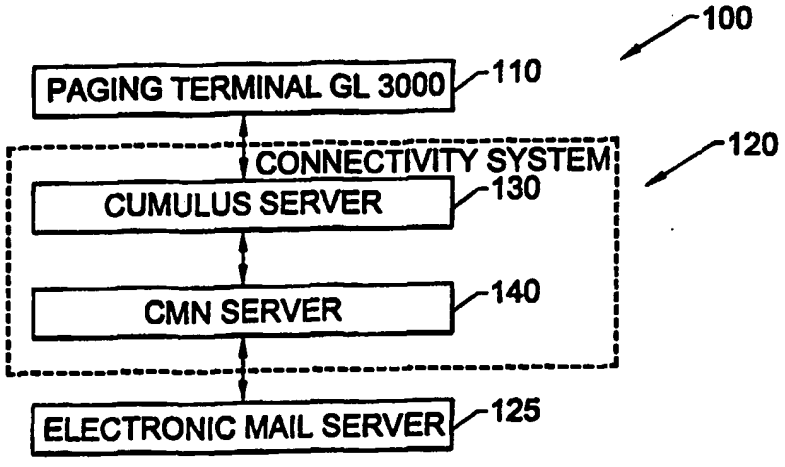
(57) Abstract

A system and method are provided for automatically or selectively forwarding a user's wireless messages to the user's electronic mail account and automatically or selectively forwarding a user's electronic mail account messages to the user's wireless communication device. A loop control string is provided to prevent the endless looping of forwarded messages between the two communication mediums. Specifically, a message originally received by either an electronic mail messaging system or a paging terminal is forwarded to a connectivity system in accordance with an embodiment of the present invention where it is converted into an intermediate format for processing and a loop control string is associated with the message. The message is then forwarded on to the other of the electronic mail messaging system or the paging terminal. In an automatic fashion, the message is forwarded back to the connectivity system where the message is checked for the loop control string. If a loop control string is associated with the message, then the message is not processed any further. If the loop control string is not associated with the message, then the message is processed and forwarded.



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SYSTEMS AND ASSOCIATED METHODS FOR COMBINING WIRELESS MESSAGING AND ELECTRONIC MAIL MESSAGING

FIELD OF THE INVENTION

The present invention relates generally to providing a complete communications system with message forwarding, and more particularly, to systems and methods for allowing messages sent to electronic mail accounts and messages sent to wireless communication devices to be forwarded to the other communication medium.

BACKGROUND OF THE INVENTION

With the advent of the communications age, many people have multiple pathways for communications including wireless communication devices, such as pagers, and electronic mail accounts. Because of these many and varied lines of communication, the time required to monitor the various pathways has increased. People receiving pager messages often want these messages duplicated on their electronic mail accounts so that they will have a permanent record of the message in a medium that they may easily manipulate. Additionally, an intended electronic mail recipient is often unaware that a message has actually arrived if they are away from their office, and may not possess the wherewithal to obtain the message on a timely basis. Therefore, the parties in communication may lose control of critical information. Likewise, people often want to receive electronic mail as pager messages also because of the limitation that electronic mail is only effective when an intended recipient has access to a terminal capable of receiving such communications.

There remains a true need for a method and system capable of forwarding electronic messages automatically or based upon user defined parameters to pager devices and capable of forwarding pager messages to electronic mail accounts.

SUMMARY OF THE INVENTION

A system and method are provided for automatically or selectively forwarding a user's wireless messages to the user's electronic mail account and automatically or selectively forwarding a user's electronic mail account messages to the user's wireless communication device. A loop control string is provided to prevent the endless looping of forwarded messages between the two communication mediums. Specifically, a message originally received by either an electronic mail messaging system or a paging terminal is forwarded to a connectivity system in accordance with an embodiment of the present invention where it is converted into an intermediate format for processing and where a loop control string is associated with the message. The message is then forwarded on to the other of the electronic mail messaging system or the paging terminal. In an essentially automatic fashion, the message is forwarded back to the connectivity system where the message is checked for the loop control string. If a loop control string is associated with the message, then the message is not processed any further. If the loop control string is not associated with the message, then the message is processed and forwarded. Thus, each message, whether electronic mail or paging, is sent to the user's pager and deposited in the user's electronic mail account without any unwanted looping between the two communication mediums.

An aspect of the present invention provides a messaging system which comprises a wireless terminal that processes a wireless message that is transmitted to a wireless communication device and that forwards the wireless message; an electronic mail messaging system that processes an electronic mail message associated with an electronic mail account and that forwards the electronic mail messages; and a connectivity system that is connected to the wireless terminal and the electronic messaging system. The connectivity system converts the wireless message forwarded from the wireless terminal to an electronic messaging format for processing as a second electronic mail message by the electronic mail messaging system, and converts the electronic mail message forwarded from the electronic messaging system to a wireless

messaging format for processing as a second wireless message by the wireless terminal.

According to one embodiment of the present invention, the wireless communication device is a pager and the wireless terminal is a paging terminal. Also the electronic messaging format can be the Simple Mail Transfer Protocol and the wireless messaging format may be the Telocator Network Paging Protocol or the Glenayre Computer Protocol.

The connectivity system processing may be distributed across many computer devices or may be concentrated into a single computer device. One embodiment of the present invention comprises a first system that adds an identifying loop control string to messages that are to be forwarded and a second system that checks for the loop control string in the messages. According to one embodiment of the present invention, the messages are converted into a processing protocol for operation thereon by either the first or second system of the connectivity system. The processing protocol may be the Extensible Markup Language and the electronic messaging format may be the Simple Mail Transfer Protocol.

Another aspect of the present invention is a method for preventing message looping in a combined messaging system which comprises receiving a message from an electronic mail account in an electronic messaging format,

parsing the message to obtain the component parts of the message, associating a loop control string for showing the source of the message, and converting the message into a wireless formatted message. In one embodiment of the present invention, the message is converted into a Telocator Network Paging Protocol formatted message. In another embodiment of the present invention, the message is converted into a Glenayre Computer Protocol formatted message.

Another aspect of the present invention is a method for forwarding wireless messages in a messaging system which includes the steps of receiving a message forwarded from a wireless terminal, determining if the message was forwarded from the an electronic mail account, converting the message to an electronic messaging format. and forwarding the message to the electronic mail

account if the message was not forwarded from the electronic mail account. This aspect of the present invention may also include the step of verifying that the user has an electronic mail account associated with the user's wireless communication device. In one embodiment of the present invention, the wireless terminal is a paging terminal and electronic messaging format is the Simple Mail Transfer Protocol.

Another aspect of the present invention is a method for forwarding wireless messages in a messaging system which comprises the steps of receiving a message forwarded from a wireless terminal, determining if the message was forwarded from an electronic mail account, converting the message to an electronic messaging format, accessing a user preference file associated with electronic mail account, and forwarding, in compliance with the user preference file, the message to the electronic mail account if the message was not forwarded from the electronic mail account. In one embodiment, the wireless terminal is a paging terminal and electronic messaging format is the Simple Mail Transfer Protocol.

Another aspect of the present invention is a method for forwarding electronic mail messages in a messaging system which comprises the steps of reading a message at an electronic mail account, transforming the message from an electronic messaging protocol to an intermediate protocol for processing, adding a loop control string to the message, converting the message to a wireless protocol, and forwarding the message to a wireless terminal. This aspect of the present invention may also include the step of verifying that the user has an electronic mail account associated with the user's wireless communication device. In one embodiment, the message is converted into a Telocator Network Paging Protocol formatted message. In another embodiment, the message is converted into a Glenayre Computer Protocol formatted message. Also, in an embodiment the wireless terminal is a paging terminal.

Another aspect of the present invention provides a signal embodied in a carrier wave which comprises a message that is forwarded from an electronic messaging system to a wireless terminal and a loop control string for identifying

a source of the message. In an embodiment. the message is in Glenayre Computer Protocol format.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a block diagram of a paging messaging system according to one embodiment of the present invention wherein a paging terminal is used for illustration.

Figure 2 is a flowchart illustrating the operation of marking a message with source identifying information as according to one embodiment of the present invention.

Figure 3 is a flowchart illustrating the operation of forwarding messages from the wireless terminal to an electronic mail account according to one embodiment of the present invention.

Figure 4 is a flowchart illustrating the operation of forwarding messages from the wireless terminal to an electronic mail account in compliance with a user preference file according to one embodiment of the present invention.

Figure 5 is a flowchart illustrating the operation of forwarding messages from the an electronic mail server to a wireless communication device according to one embodiment of the present invention.

Figure 6 is a functional block diagram showing the operations of forwarding messages from a paging terminal to an electronic mail account for a paging messaging system according to one embodiment of the present invention.

Figure 7 is a functional block diagram showing the operations of forwarding messages from an electronic mail account to a paging terminal for a paging messaging system according to one embodiment of the present invention.

Figure 8 illustrates a web page that allows a user to customize some elements of the forwarding process for a paging messaging system according to one embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

The present invention now will be described more fully hereinafter with reference to the accompanying drawings, in which preferred embodiments of the invention are shown. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art. Like numbers refer to like elements throughout.

Referring now to Figure 1, a paging messaging system **100** in accordance with an embodiment of the present invention is illustrated. The illustrated paging messaging system **100** comprises a paging terminal **110,** such as paging terminal GL3000 manufactured by Glenayre Electronics, Inc., Charlotte, NC, a connectivity system **120**, and an electronic mail server **125**. The connectivity system **120** operates to interface the paging terminal **110** and the electronic mail server **125** by converting the protocol of a paging message, such as Telocator Network Paging Protocol (TNPP), to an electronic mail message format, such as Simple Mail Transfer Protocol (SMTP), for forwarding the message to a user's electronic mail account. TNPP is an ASCII character oriented protocol normally used for internal routing of pages within a paging system and transmitted via a standard RS-232 asynchronous data link. TNPP uses common headers in all data formats to indicate source and destination for all data packets. SMTP is a Transmission Control Protocol/Internet Protocol (TCP/IP) protocol used for sending and receiving electronic mail messages on the Internet. For purpose of the present disclosure, a message includes any individual character, digit or symbol or any grouping of characters, digits or symbols for the purpose of conveying information.

The electronic mail server **125** may be implemented as a unix based computer system, though other computer based systems may be utilized to implement the electronic mail server **125** as will be appreciated by those skilled in the art. The electronic mail server **125** may include a full range of standard web based electronic mail features such as security, remote access, management

functions, or any other standard functionality commonly found in Internet based messaging systems.

The connectivity system **120**, which is but one example of an embodiment of the present invention, comprises a Windows NT based computer server **130**, hereinafter referred to as the Cumulus server **130**, for interfacing with the paging terminal **110** and providing the proper protocol and a second Windows NT based computer server **140**, hereinafter referred to as the Celpage Mail Network (CMN) server **140**, for processing the message, including adding or checking the loop control string in the message header. The Cumulus server **130** is bidirectionally connected to the serial lines of the paging terminal **110** so that it may read the paging messages that are sent to the paging terminal **110** for transmission to a user's pager. The Cumulus server **130** can also write messages to the paging terminal **110** if the paging messaging system **100** wants to forward an electronic mail message to a user's pager. Of course, this processing may be combined into a single computer or distributed over a wide array of servers to achieve the same effect. This discussed embodiment does not serve to limit the implementation of the processing in accordance with the present invention.

In accordance with an aspect of the present invention, a message, whether electronic mail or paging, is marked to identify its source so that subsequent checking will reveal whether the message should be processed further. Specifically, since messages are automatically forwarded from one communication medium (*e.g.*, either electronic mail or paging) to the other, messages may endlessly loop between the two communication mediums. By marking each message to identify its source, subsequent checks to determine if the message has already been processed by both communication mediums can prevent any unwanted looping. While there are numerous suitable methods of marking a message to identify its source, all of which are within the scope of the present invention, such as setting a flag, the exemplary method disclosed herein comprises the insertion of a control string of characters into the message header, as discussed in more detail below.

The present invention may be implemented by marking the source of a message when the message originates in the wireless messaging system before it is forwarded to the electronic mail messaging system or by marking the source of a message when the message originates in the electronic mail messaging system before it is forwarded to the wireless messaging system. The connectivity system may mark the source of messages when forwarding the message from communication medium A to communication medium B and then checks for the source of the message when forwarding messages from communication medium B to communication medium A. The following figures and accompanying disclosure describe the present invention in an preferred embodiment where the connectivity system marks the source of the message when forwarding the message to the wireless messaging system and checks the source of the message when forwarding the message to the electronic mail messaging system. However, one of ordinary skill in the art will appreciate that another preferred embodiment of the present invention is implemented in a substantially similar manner with the connectivity system marking the source of the message when forwarding the message to the electronic mail messaging system and checking for the source of the message when forwarding the message to the wireless messaging system.

Referring now to Figure 2, a flowchart illustrating the operations of marking a message with source identifying information as according to one embodiment of the present invention is shown. The process of marking an electronic mail message begins once a message is received in a user's mail account, as shown in block **200.** The message is parsed into its separate elements, as shown in block **210,** so that the message may be reformatted into a paging compatible protocol with the addition of the loop control string. The loop control string is then added as an element to the message header so that the message can be identified as originating from the user's electronic mail account as shown in block **220**. The loop control string is chosen so as to comprise a unique character or character string so that the source of the message may be identified. For example, a loop control string consisting of the string "www" may

be used to designate that the originating source of a message was an electronic mail account. Preferably, no other message would have this character string placed into the header of the message. The message, containing the loop control string, is then converted to a wireless protocol, shown in block **230**, such as TNPP for further routing within a paging system.

Now referring to Figure 3, a flowchart illustrating the operation of forwarding messages from the wireless terminal to an electronic mail account according to one embodiment of the present invention is shown. The process of forwarding messages from the wireless terminal begins when a message is received at the wireless terminal, as shown in block **250**. The source of the message must be determined to ensure that a message that has already been forwarded from an user's electronic mail account to his wireless communication device (a wireless communication device may include, for example, pagers, cellphones, including PCS and mobile phones with dispatch services, with messaging capabilities and any other wireless communication devices that use messaging) is not forwarded back to the user's electronic mail account. See block **260**. The source of the message can be determined by examining the message header to see if the loop control string is present. If the loop control string is in the message header, then the user's electronic mail account was the source of the message and therefore, the message should not be forwarded back to the user's electronic mail account. By utilizing this loop control string, an endless loop of message forwarding can be avoided. Assuming that the message header does not contain the loop control string and thus the message should be forwarded, the format of the message needs to be changed to a format that is compatible with the electronic messaging system, such as the SMTP. See block **270**. Once the message has been converted to the proper form, it is ready for delivery to the electronic mail server which governs the user's electronic mail account, as shown in block **280**.

Referring now to Figure 4, a flowchart illustrating the operation of forwarding messages from a wireless terminal to an electronic mail account in compliance with a user preference file according to one embodiment of the

present invention is shown. This process is substantially identical to the process discussed above in Figure 3 except that before the message is forwarded to the electronic mail server, a user preference file associated with the specific user must be accessed to determine user defined forwarding parameters as shown in block **275**. These user defined parameters include alternative or additional forwarding addresses, whether or not all messages should be forwarded and which particular messages should or should not be forwarded (*e.g.*, a filter to ensure that high priority messages are forwarded if desired and/or to provide a mechanism for users to filter out unwanted electronic mail messages including messages commonly known as spam).

Referring now to Figure 5, a flowchart illustrating the operation of forwarding messages from the an electronic mail account to a wireless communication device according to one embodiment of the present invention is shown. To begin the forwarding process, a message is read once it is received at an user's electronic mail account as shown in block **300**. Of course, to avoid having to continuously scan all of the electronic mail accounts for new messages, alerts of new messages or the new messages themselves may be sent to the connectivity system **120** (specifically to the CMN server **140** in a preferred embodiment of the present invention). Next, the electronic mail message is changed into an electronic record format so that the information in the message may readily be used to extract information from the electronic mail server **125** about the user, the status of his account and his preferences. See block **310**. The loop control string is then added to the record format so that the source of this message can be identified, as shown in block **320**. The message is then converted to a paging protocol format such as TNPP, so that the message may be routed and delivered to the pager device as shown in block **330**. The message is then forwarded for delivery to the paging terminal. See block **340**.

Referring now to Figure 6, a functional block diagram showing the functional components and associated operations involved in forwarding messages from a paging terminal to an electronic mail account for a paging messaging system according to one embodiment of the present invention is

shown. However, the present invention may also be implemented with other wireless communication messaging systems. Also, the present invention may alternatively be implemented by having the paging messaging system mark the source of the message and the electronic mail messaging system check the source of the message before it will forward the message. Figure 6 shows a paging terminal **400**, such as paging terminal GL3000 manufactured by Glenayre Electronics, Inc., Charlotte, NC that may receive messages to transmit to pagers from a variety of sources including from a telephone, a voice mail, a live operator keying in the message, directly by modem using the Telocator Alphanumeric Protocol (TAP), or from a personal computer using the Internet. In accordance with an embodiment of the present invention, the paging terminal **400** transmits these messages to the appropriate pager devices regardless of their source and also forwards these messages to a Cumulus system **410** operating Windows NT or other similar operating systems. A reader **402** of the Cumulus system **410** reads the received messages that are in a paging format. For this particular embodiment, the messages received in the reader **402** are formatted in the TNPP/CDRF protocol which is a TNPP formatted data packet which contains the message in a Call Detail Record format (CDRF) which is a proprietary Glenayre Electronic, Inc. format defined in its publicly available technical manual PN 9110.01182. These messages are then converted by a converter **404** into an Extensible Markup Language (XML) which is a flexible self-defining language to create common information formats by describing the content in terms of the data being described. The newly formatted XML messages are then placed in a Microsoft Message Queue Server (MSMQ) **406** which provides fault tolerant delivery to a CMN system **420** for processing the messages to determine their source. The CMN system **420** first reads the XML formatted messages with a reader **408**. The messages are then converted to an electronic mail record format by a converter **412** and the message is then parsed to obtain specific information about the message including the user to whom the message was sent. Having the user information, the validity of the user's account is then checked at a validator **414** to ensure that the account is active. The message header is then checked for

the presence of the loop control string by a loop control mechanism **416**. If the loop control string is present. then the message is sent from the user's electronic mail account and thus will not be forwarded back to the user's electronic mail account. The message is further processed by a processing mechanism **418** according to subscriber preferences and account status. If the account is not active, then the message preferably will be discarded. The electronic mail record format is then converted to a electronic mail message in accordance with the SMTP by electronic mail mechanism **422**. Finally, the message that began as a paging message in TNPP format is forwarded to a user's electronic mail account located on the messaging system's electronic mail server **450** in SMTP format.

Referring now to Figure 7, a functional block diagram showing the functional components and associated operations in forwarding messages from an electronic mail account to a paging terminal for a paging messaging system according to one embodiment of the present invention is shown. An electronic mail server **450** is connected to the second computer system **420** wherein a reader **452** in the second computer system **420** reads the received messages that are in user's electronic mail account. A converter **454** of the second computer system **420** then converts the format of the mail message from SMTP to a more generic electronic mail record format so that individual components of the message may be used by the second computer system **420** for such uses as validating the user's account by a validator **456**. If the user's account is not active then the message will not be forwarded. Assuming a valid account, the loop control string is added to the email record format by a loop control mechanism **458**, and thereby the source of this message will be associated with the record. The message in email record format is then converted to TNPP format by a converter **460** so that the message may be routed for delivery to the paging terminal **400**. The message in TNPP format is then placed in a Microsoft Message Queue Server (MSMQ) **462** which provides fault tolerant delivery to the first computer system **410** for delivery to the paging terminal **400**. The first computer system **410** is communicatively connected to the second computer system **420** and the paging terminal **400**. The second computer system **420** reads the message from the

MSMQ queue **464** and buffers the record for a period of time or until sufficient load is reached and then the second computer system **420** converts the message into a Glenayre proprietary format termed Glenayre Computer Protocol (GLCP) **466**. A port monitor **468** of the second computer system **420** then writes the message in GLCP format to the paging terminal **400** for transmission to the user's pager.

Referring now to Figure 8, a web page **500** that allows a user to customize some elements of the forwarding process for a paging messaging system according to one embodiment of the present invention is shown. The web page **500** contains a menu of customizable options **510** which include the ability to toggle on or off the forwarding of electronic mail messages to a user's electronic mail account at field **512** the ability to select and alternative destination for sending the forwarded electronic mail messages at field **516.** Additional options including filters to avoid unsolicited or otherwise unwanted mail messages may also be added to the menu of customizable options **510**.

Many modifications and other embodiments of the invention will come to mind to one skilled in the art to which this invention pertains having the benefit of the teachings presented in the foregoing descriptions and the associated drawings. Therefore, it is to be understood that the invention is not to be limited to the specific embodiments disclosed and that modifications and other embodiments are intended to be included within the scope of the appended claims. Although specific terms are employed herein, they are used in a generic and descriptive sense only and not for purposes of limitation.

THAT WHICH IS CLAIMED:

1. A messaging system, comprising:

a wireless terminal that processes wireless messages that are transmitted to a wireless communication device;

an electronic mail messaging system that processes electronic mail messages associated with an electronic mail account; and

a connectivity system communicatively connected to the wireless terminal and the electronic mail messaging system, wherein the connectivity system receives a first wireless message from the wireless terminal, converts the wireless message to a first electronic mail message, and forwards the first electronic mail message to the electronic mail messaging system for processing, and wherein the connectivity system receives a second electronic mail message from the electronic mail messaging system, converts the second electronic mail message to a second wireless message, and forwards the second wireless message to the wireless terminal for processing.

2. The system of Claim 1 wherein the wireless communication device is a pager and the wireless terminal is a paging terminal.

3. The system of Claim 1 wherein the first electronic mail message is formatted as a Simple Mail Transfer Protocol message.

4. The system of Claim 1 wherein the second wireless message is formatted as a Telocator Network Paging Protocol message.

5. The system of Claim 1 wherein the second wireless message is formatted as a Glenayre Computer Protocol.

6. The system of Claim 1 wherein the connectivity system comprises:

a first system that adds a loop control string to messages forwarded to one of the wireless terminal and the electronic mail messaging system, and a second system that checks for the loop control string in messages forwarded to the other of the wireless terminal and the electronic mail messaging system.

7. The system of Claim 6 wherein the connectivity system converts wireless messages into a processing protocol for operation thereon by the second system, and converts electronic mail messages to the processing protocol for operation thereon by the first system.

8. The system of Claim 6 wherein the connectivity system converts wireless messages into a processing protocol for operation thereon by the first system, and converts electronic mail messages to the processing protocol for operation thereon by the second system.

9. The system of Claim 8 wherein the processing protocol comprises Extensible Markup language.

10. A method for preventing message looping in a combined messaging system, comprising:

receiving a message from an electronic mail account in an electronic messaging format;

parsing the message to obtain a plurality of elements of the message;

associating a loop control string for denoting a source of the message with the plurality of elements of the message; and

converting the plurality of elements of the message and the loop control string into a wireless formatted message.

11. The method of Claim 10 wherein the converting the plurality of elements of the message step comprises converting the plurality of elements of the message and the loop control string to a Telocator Network Paging Protocol formatted message.

12. The method of Claim 10 wherein the converting the plurality of elements of the message step comprises converting the plurality of elements of the message and the loop control string to a Glenayre Computer Protocol formatted message.

13. A method for forwarding wireless messages in a messaging system, comprising:

receiving a message forwarded from a wireless terminal, wherein the message is associated with a wireless account;

determining if the message was forwarded from the an electronic mail account; and

converting the message to an electronic messaging format and forwarding the message to the electronic mail account if the message was not forwarded from the electronic mail account.

14. The method of Claim 13 wherein receiving the message forwarded from a wireless terminal comprises receiving the message from a paging terminal.

15. The method of Claim 13 wherein converting the message to an electronic messaging format comprises converting the message to a Simple Mail Transfer Protocol message.

16. The method of Claim 13 further comprising verifying that the electronic mail account is associated with the wireless account.

17. A method for forwarding wireless messages in a messaging system, comprising:

receiving a message forwarded from a wireless terminal;

determining if the message was forwarded from an electronic mail account;

accessing a user preference file associated with electronic mail account; and

converting the message to an electronic messaging format and forwarding, in compliance with the user preference file, the message to the electronic mail account if the message was not forwarded from the electronic mail account.

18. The method of Claim 17 wherein converting the message to an electronic messaging format comprises converting the message to a Simple Mail Transfer Protocol message.

19. A method for forwarding electronic mail messages in a messaging system, comprising:

reading a message at an electronic mail account;

transforming the message from an electronic messaging protocol to an intermediate protocol for processing;

adding a loop control string to the message in the intermediate protocol;

converting the message from the intermediate protocol to a wireless protocol; and

forwarding the message to a wireless terminal.

20. The method of Claim 19 further comprising verifying that the electronic mail account is valid.

21. The method of Claim 19 wherein forwarding the message to a wireless terminal comprises forwarding the message to a paging terminal.

22. The method of Claim 19 wherein converting the message to a wireless protocol comprises converting the message to a Telocator Network Paging Protocol message.

23. The method of Claim 19 wherein converting the message to a wireless protocol comprises converting the message to the Glenayre Computer Protocol.

24. A signal embodied in a carrier wave, comprising:

a message that is forwarded from an electronic mail messaging system to a wireless terminal; and

a loop control string for identifying a source of the message as an electronic mail messaging system.

25. The signal in Claim 24 wherein the message is in Glenayre Computer Protocol format.

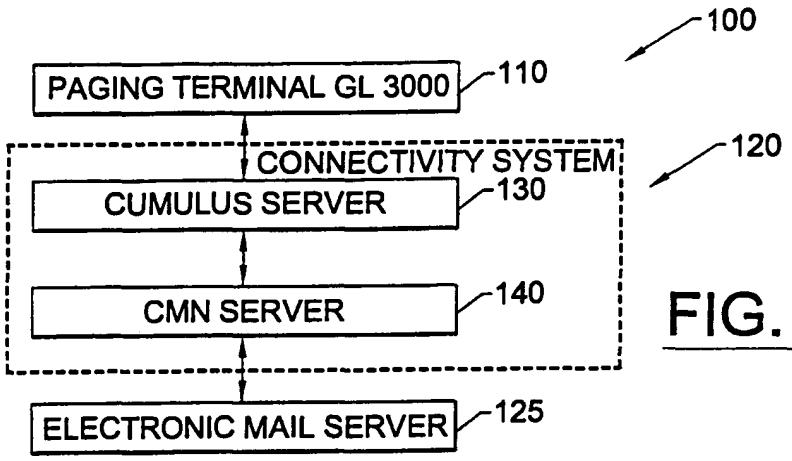

FIG. 1.

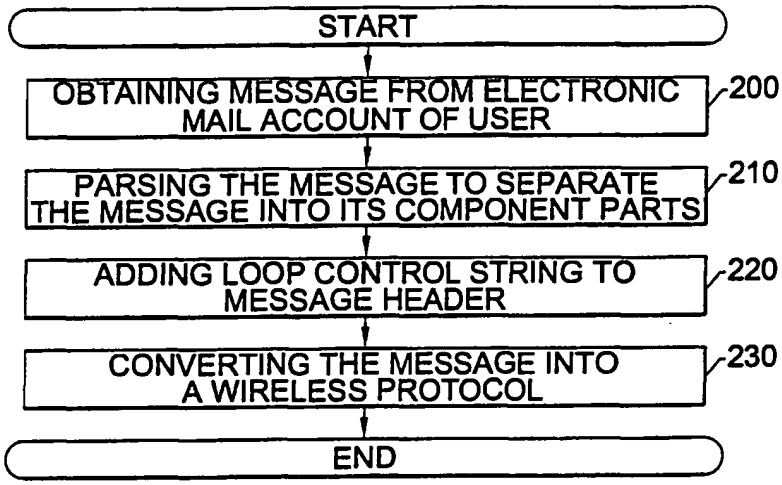

FIG. 2.

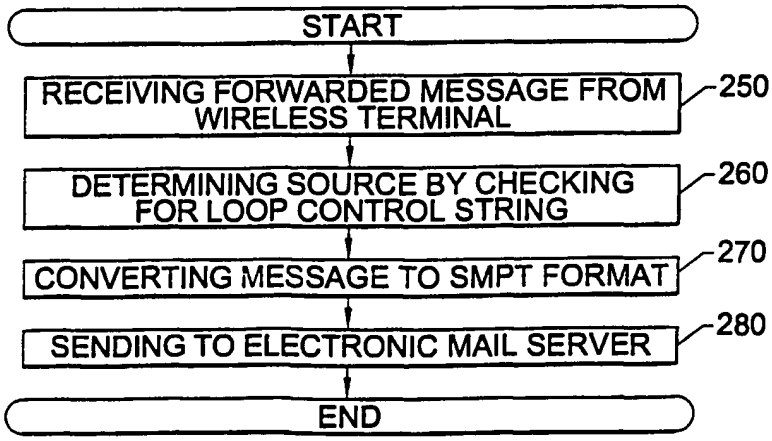

FIG. 3.

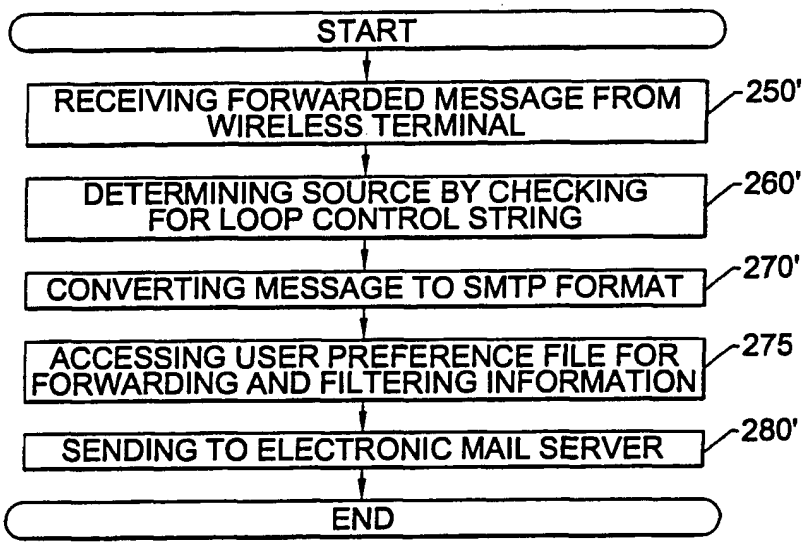
START
RECEIVING FORWARDED MESSAGE FROM WIRELESS TERMINAL
250'
DETERMINING SOURCE BY CHECKING FOR LOOP CONTROL STRING
260'
CONVERTING MESSAGE TO SMTP FORMAT
270'
ACCESSING USER PREFERENCE FILE FOR FORWARDING AND FILTERING INFORMATION
275
SENDING TO ELECTRONIC MAIL SERVER
280'
END

FIG. 4.

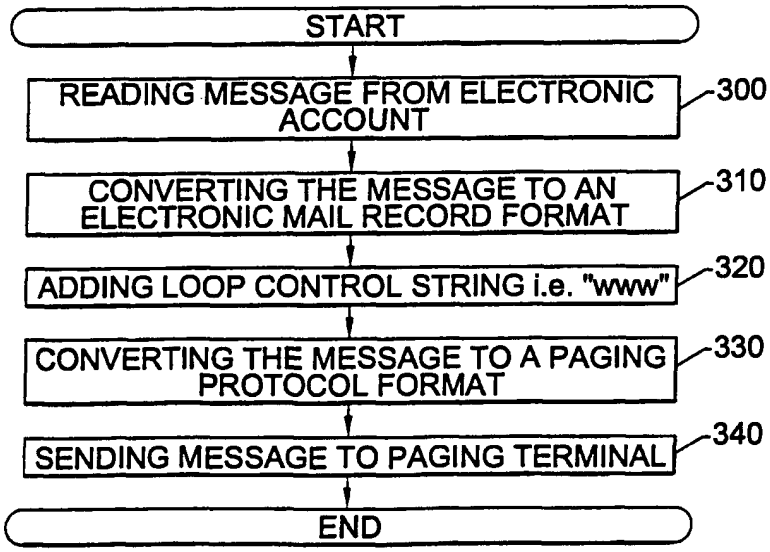
START
READING MESSAGE FROM ELECTRONIC ACCOUNT
300
CONVERTING THE MESSAGE TO AN ELECTRONIC MAIL RECORD FORMAT
310
ADDING LOOP CONTROL STRING i.e. "www"
320
CONVERTING THE MESSAGE TO A PAGING PROTOCOL FORMAT
330
SENDING MESSAGE TO PAGING TERMINAL
340
END

FIG. 5.

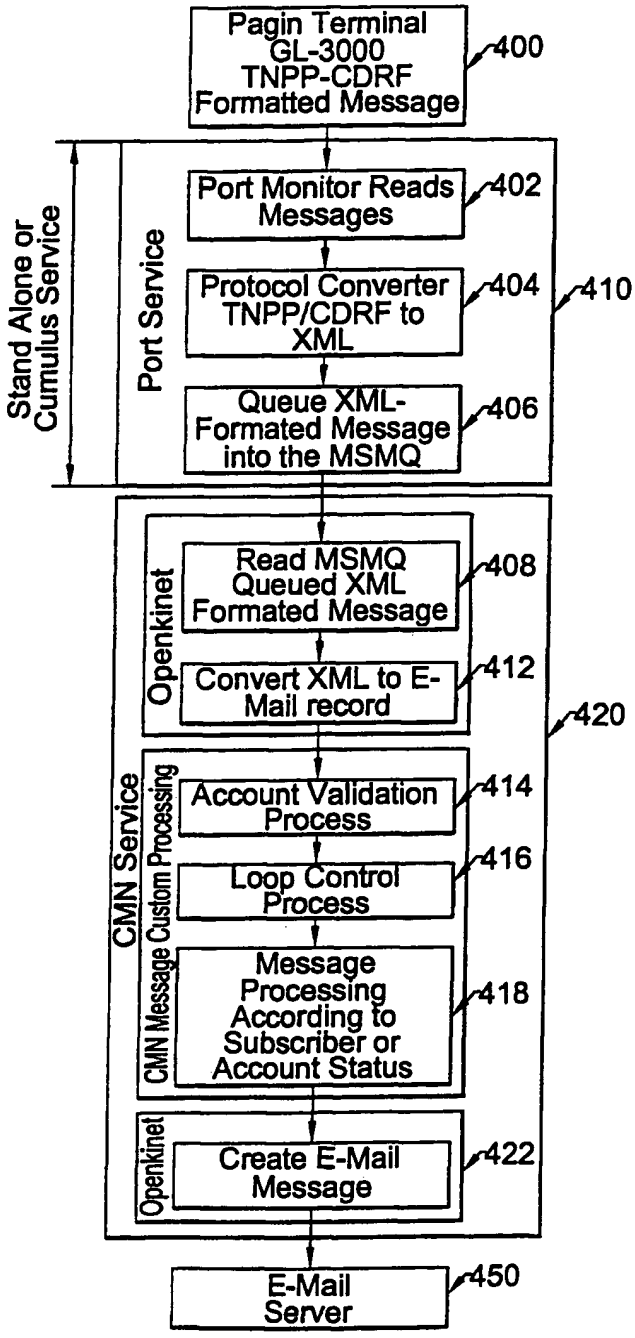
Pagin Terminal GL-3000 TNPP-CDRF Formatted Message
400
Stand Alone or Cumulus Service
Port Service
Port Monitor Reads Messages
402
Protocol Converter TNPP/CDRF to XML
404
410
Queue XML-Formated Message into the MSMQ
406
CMN Service
Openkinet
Read MSMQ Queued XML Formated Message
408
Convert XML to E-Mail record
412
420
CMN Custom Processing
Account Validation Process
414
Loop Control Process
416
CMN Message
Message Processing According to Subscriber or Account Status
418
Openkinet
Create E-Mail Message
422
E-Mail Server
450

FIG. 6.

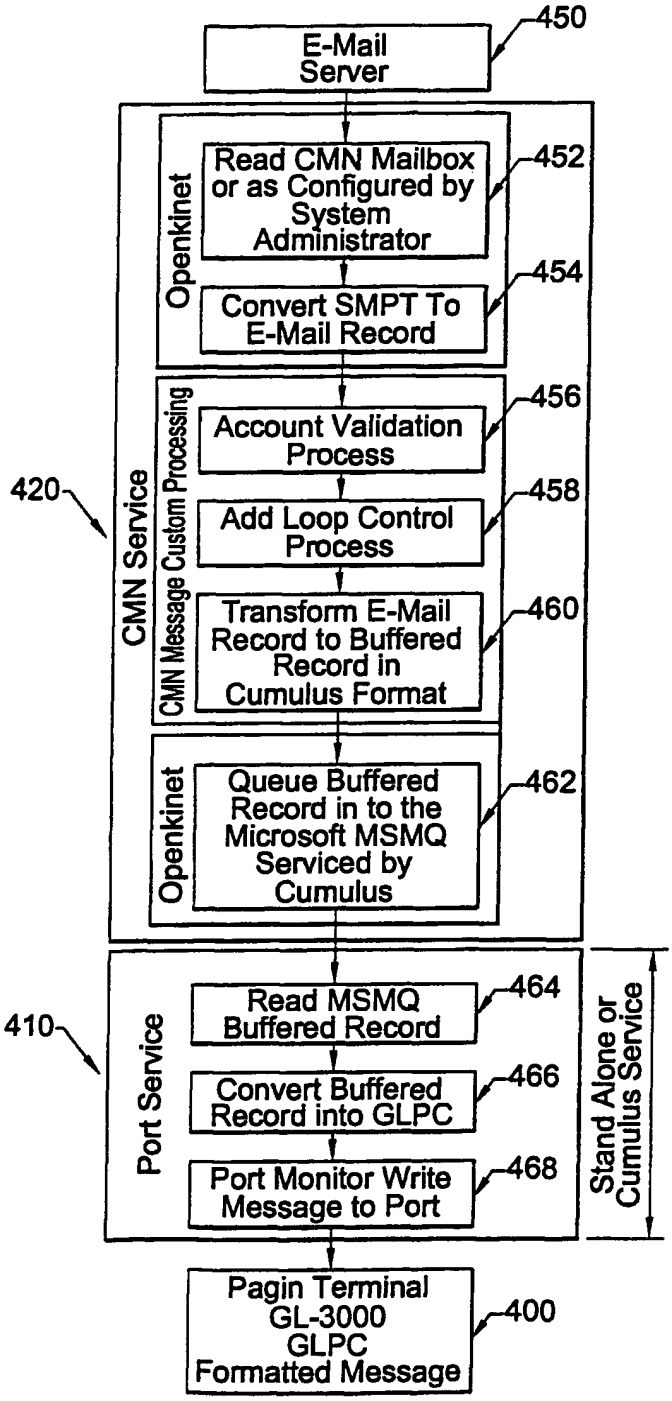
E-Mail Server
450
Openkinet
Read CMN Mailbox or as Configured by System Administrator
452
Convert SMPT To E-Mail Record
454
CMN Service
CMN Message Custom Processing
Account Validation Process
456
Add Loop Control Process
458
Transform E-Mail Record to Buffered Record in Cumulus Format
460
420
Openkinet
Queue Buffered Record in to the Microsoft MSMQ Serviced by Cumulus
462
Port Service
Read MSMQ Buffered Record
464
Convert Buffered Record into GLPC
466
Port Monitor Write Message to Port
468
410
Stand Alone or Cumulus Service
Pagin Terminal GL-3000 GLPC Formatted Message
400

FIG. 7.

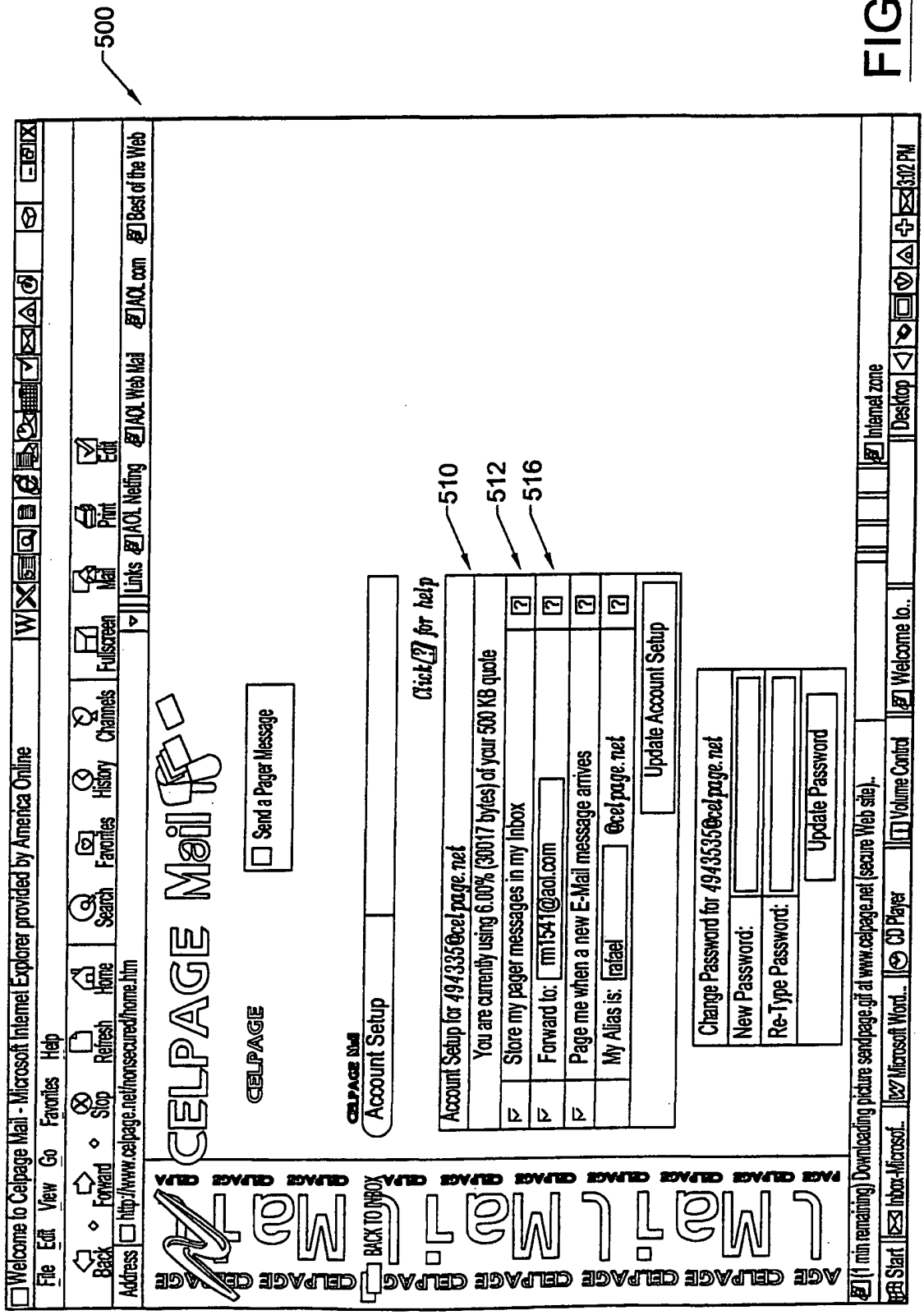
500
Welcome to Celpage Mail - Microsoft Internet Explorer provided by America Online
File Edit View Go Favorites Help
Back Forward Stop Refresh Home Search Favorites History Channels Fullscreen Mail Print Edit
Address http://www.celpage.net/nonsecured/home.htm
Links AOL Netfing AOL Web Mail AOL.com Best of the Web
CELPAGE Mail
CELPAGE
Send a Pager Message
Account Setup
BACK TO INBOX
Click [?] for help
510
512
516
Account Setup for 4943356@cel page. net
You are currently using 6.00% (30017 bytes) of your 500 KB quote
Store my pager messages in my Inbox
Forward to: rm1541@aol.com
Page me when a new E-Mail message arrives
My Alias is: rafael @cel page. net
Update Account Setup
Change Password for 4943356@cel page. net
New Password:
Re-Type Password:
Update Password
(1 min remaining) Downloading picture sandpage.gif at www.celpage.net (secure Web site)...
Internet zone
Start Inbox-Microsof... Microsoft Word... CD Player Volume Control Welcome to... Desktop 3:02 PM

FIG. 8.

INTERNATIONAL SEARCH REPORT

I. ...national Application No
PCT/US 00/04516

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04Q7/22 H04L12/58 H04M3/533 H04M3/537

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04Q H04L H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98 35513 A (SIEMENS AG ;STELZER MANFRED (DE)) 13 August 1998 (1998-08-13) page 2, line 1 - line 18 page 7, line 9 -page 9, line 11 page 18, line 28 - line 35	1
Y	WO 98 53624 A (SEIKO COMMUNICATIONS OF AMERIC) 26 November 1998 (1998-11-26) page 8, line 1 -page 10, last line	1-5
Y	US 5 604 788 A (TETT RICHARD J) 18 February 1997 (1997-02-18) column 2, line 1 -column 4, line 20	1-5
A	US 5 751 960 A (MATSUNAGA RYOTARO) 12 May 1998 (1998-05-12) column 2, line 28 - line 51 column 2, line 66 -column 3, line 9	10,13, 17,19,24

-/--

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
23 June 2000	03/07/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Baas, G

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 00/04516

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 742 905 A (BROCKMAN JAMES JOSEPH ET AL) 21 April 1998 (1998-04-21) column 19, line 30 - line 41 column 26, line 15 - line 29	1
A	EP 0 854 655 A (MOTOROLA INC) 22 July 1998 (1998-07-22) column 1, line 57 -column 5, line 1	1

Form PCT/ISA/210 (continuation of second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Information on patent family members

In ational Application No
PCT/US 00/04516

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9835513 A	13-08-1998	CN 1247005 T	08-03-2000
		EP 0958704 A	24-11-1999
WO 9853624 A	26-11-1998	AU 6148998 A	11-12-1998
US 5604788 A	18-02-1997	NONE	
US 5751960 A	12-05-1998	JP 7162454 A	23-06-1995
US 5742905 A	21-04-1998	CA 2199802 A	28-03-1996
		EP 0782805 A	09-07-1997
		JP 9511884 T	25-11-1997
		WO 9609714 A	28-03-1996
		US 5742668 A	21-04-1998
EP 0854655 A	22-07-1998	NONE	